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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,207	02/26/2002	Ben-Chuan Du	742433-0026	4668

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EXAMINER

NGUYEN, LAM S

ART UNIT PAPER NUMBER

2853

DATE MAILED: 09/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Application No.

10/082.207

Applicant(s)
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DU ET AL.

**Examiner**

LAM S. NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 25 July 2005.  
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 15-37 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All    b) ☐ Some \*    c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 15-16, 18-21, 23-26, 28-34, and 36-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al. (US 5914731) in view of Becerra et al. (US 5675365).

Yano et al. discloses a printing apparatus comprising a print head for scanning over a printing medium in a predetermined direction (*FIG. 33: The predetermined direction is the one parallel to the arrow of MAIN SCANNING*), said print head comprising a printing element set comprising M printing elements for selectively forming images on said printing medium, wherein M is a positive integer (*FIG. 26: M is 128 heaters*);

a timing device for, in response to a reference timing sequence (*FIG. 28, S112: A basic driving pulse is used as a timing reference*) and a random value series (*FIG. 28, S113: The random value series is 16 random numbers from the random number table*) generating N sets of driving timing sequences (*FIG. 26, step S114-115: 16 timing sequences each represents a heat signal provided to one of 16 heaters*), said random value series including N random values, each of the N sets of driving timing sequence being obtained by shifting said reference timing sequence with corresponding one of N random values (*FIG. 28: Each set of heat signal H1 to H16 in step S114 is derived/shifted from the basic driving pulse in step S112*

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and the random number in step S113), wherein N is a positive integer (*FIG. 28, S113:  $N=16$* )

(Referring to claims 25, 33); and

a driving device for, in response to said N sets of driving timing sequences, forming said dot image (*FIG. 26-28: The heat signals H1-H16 drives the heaters during the printing operation*), wherein each set of driving timing sequences sequentially drives the M printing elements (*FIG. 26: The heat signals H1-H16 sequentially drive the 128 heaters*) to provide random distances in the predetermined direction between consecutive dot images formed by the printing element set of the printing head (*FIG. 29: Because the consecutive dots in the main scanning direction are printed under random dot size control, the spaces (or the boundary-to-boundary distances) between the consecutive dots are also randomly changed*) so a cyclic unevenness of said image is scattered (*column 2, lines 33-38: When the dot size is randomly changed, the white/black stripe-shaped can be eliminated*).

Yano et al. does not disclose wherein the random distance is a distance between centers of consecutive dot images.

Becerra et al. discloses an ink jet printing device having a printhead (*FIG. 3, element 20*) for forming images by printing dot images (*FIG. 7*) on a printing medium while the printhead moves across the printing medium in the *P* direction, wherein the distance between centers of consecutive dot images is varied randomly respect to the *P* direction (*FIG. 7 and column 15, lines 19-47*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to modify the printing apparatus disclosed by Yano et al. to randomly change the distance between centers of consecutive dot images as disclosed by Becerra et al. The

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motivation for doing so would have been to establish a random-looking distribution of spots over a wide range as taught by Becerra et al. (*column 15, lines 30-43*).

**Yano et al. also discloses the following claimed invention:**

**Referring to claims 16, 21, 26, and 34:** wherein said timing device respectively adds N random values to said reference timing sequence to generate said N set of driving timing sequences (*column 18, lines 1-14*).

**Referring to claims 18, 29:** further comprising a unit for generating said random value series, said random value series being transmitted to said timing device via a transmission protocol (*FIG. 27, 30, element 1703 and FIG. 9, element 11*).

**Referring to claims 19, 23, 30, 37:** wherein said print head is an ink jet head to perform printing (*FIG. 3*).

**Referring to claims 28, 36:** wherein said random value sequence is composed of a set of numbers in random order (*column 18, lines 42-48*).

**Referring to claim 31:** wherein said printing elements are divided into multiple groups, said timing device generating a driving timing sequence for one group of printing elements by shifting the reference timing sequence with a random amount (*FIG. 26: 128 heaters are divided into 8 groups that are driven by the heat signals H1-H16*).

2. Claims 17, 22, 27, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al. (US 5914731) in view of Becerra et al. (US 5675365), as applied to claims 15, 20, 24, 32, and further in view of Iwasaki et al. (US 6142598).

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Yano et al., as modified, discloses the claimed invention as discussed above except wherein said timing device respectively multiplies N random values to said reference timing sequence to generate said N sets of driving timing sequences.

Iwasaki et al. discloses a printing apparatus in which printing elements are driven by a driving timing sequence that is generated by multiplying a reference timing sequence to a variation value sequence (*column 5, lines 5-49*) in order to eliminate the printed image unevenness that cyclically appears due to variations in the manufacturing errors (*Abstract*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the method of deriving the driving timing sequence as disclosed by Yano et al., as modified, by, instead of adding, multiplying the reference timing sequence to the random value sequence as disclosed by Iwasaki et al. The motivation of doing so is to eliminate the printed image unevenness that cyclically appears due to variations in the manufacturing errors as taught by Iwasaki et al. (*Abstract*).

### ***Response to Arguments***

Applicant's arguments with respect to claims 15, 20, 24, and 32 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S. NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D. MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN  
09/11/2005

  
HAI PHAM  
PRIMARY EXAMINER